

Organic Chemistry of Cometary Dust as Derived From PUMA 1 Data

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Onboard the Halley Fly-By spacecrafts VEGA 1, VEGA 2, and GIOTTO were the dust impact mass spectrometers PUMA 1, PUMA 2, and PIA respectively. PUMA 1 was the most sensitive instrument among them. From its data the occurrence of masslines >60 Daltons could be shown to be statistically significant. An analysis of these masslines lead to a scenario, which could explain the masslines as fragment ions from larger molecules which characterize the chemical nature of cometary organic matter as:

- highly unsaturated hydrocarbons
- some of them containing oxygen,
- less containig nitrogen, and
- a few containing oxygen and nitrogen as heteroatoms.

From the properties of the spectrometer, also some physical parameters of the dust particles could be inferred, such as their density and structure.